Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An apparatus comprising:

an estimating unit to estimate a distribution of input signal envelope, the estimating unit comprises

a comparator to compare the input signal envelope against a first reference threshold value and a second reference threshold value, and

a counter to estimate the distribution by counting occurrences in which the input signal envelope is either above or below the one or more reference threshold values within a given period, the counter to count occurrences in which the input signal envelope is above the first reference threshold value and occurrences in which the input signal envelope is below the second reference threshold value; and

an integrator to adjust a gain based upon the distribution for an automatic gain control.

2. (Cancelled).

3. (Cancelled).

4. (Original) The apparatus of claim 3, wherein the first reference threshold value is higher than the second reference threshold value.

5. (Previously Presented) The apparatus of claim 4, wherein the counter counts up when the input signal envelope is above the first reference threshold value and counts down when the input signal envelope is below the second reference threshold value.

6. (Currently Amended) The apparatus of claim 12, wherein the integrator adjusts the gain based upon the occurrences counted during the given period.

7. (Previously Presented) An apparatus comprising:

an estimating unit to estimate a distribution of input signal level, the estimating unit further comprises a variable step size generator;

an integrator to adjust a gain based upon the distribution for an automatic gain control;

a comparator to compare the input signal against one or more reference threshold values; and

a counter to estimate the distribution by counting occurrences in which the input signal level is either above or below the one or more reference threshold values within a given period, wherein

the counter to determine a percentage of time that the input signal level is either above or below the one or more reference threshold values within the given period, and generates an error signal,

the variable step size generator to select a step size factor based upon the error signal and to multiply the error signal with the selected step size factor to generate a variable error signal, and

the integrator to adjust the gain in accordance with the variable error signal.

8. (Original) The apparatus of claim 7, wherein the variable step size generator selects a large step size factor if the error signal is above a predetermined value.

9. (Original) The apparatus of claim 1, further comprising a variable step size generator to vary the speed by which the integrator adjusts the gain by gear shifting based upon the distribution.

10. (Currently Amended) A method comprising:

estimating a distribution of input signal envelope includes

comparing the input signal envelope against a first reference threshold value and a second reference threshold value, and

estimating the distribution by counting occurrences in which the input signal envelope is above the first reference threshold value and occurrences in which the input signal envelope is below the second reference threshold value within a given period; and

adjusting a gain based upon the distribution for an automatic gain control.

11-12. (Cancelled).

13. (Currently Amended) The method of claim ~~12~~10, wherein the first reference threshold value is higher than the second reference threshold value.

14. (Previously Presented) The method of claim 13, wherein counting up when the input signal envelope is above the first reference threshold value and counting down when the input signal envelope is below the second reference threshold value.

15. (Currently Amended) The method of claim ~~11~~10, wherein adjusting the automatic gain control based upon the occurrences counted during the given period.

16. (Currently Amended) A method comprising:

estimating a distribution of input signal level, estimating the distribution comprises:

determining a percentage of time that the input signal level is either above or below one or more reference threshold values within a given period, and generating an error signal;

selecting a step size factor based upon an error signal and multiplying the error signal with a selected step size factor to generate a variable error signal; and

adjusting a gain in accordance with the variable error signal;

estimating the distribution by counting occurrences in which the input signal level is either above or below the one or more reference threshold values within the given period including comparing the input signal level against a first reference threshold value and a second reference threshold value, and counting occurrences in which the input signal level is above the first reference threshold value and occurrences in which the input signal level is below the second reference threshold value.

17. (Original) The method of claim 16, wherein selecting a large step size factor if the error signal is above a predetermined value.

18. (Original) The method of claim 10, further comprising varying the speed by which the gain is adjusted by gear shifting based upon the distribution.

19. (Currently Amended) An instruction loaded in a machine readable medium comprising:

a first group of instructions to estimate a distribution of input signal envelope; ~~and~~

a second group of instruction to adjust a gain based upon the distribution for an automatic gain control;

a third group of instructions to compare the input signal envelope against one or more reference threshold values including a comparison of the input signal envelope against a first reference threshold value and a second reference threshold value; and

a fourth group of instructions to estimate the distribution by counting occurrences in which the input signal envelope is either above or below the one or more reference threshold values within a given period, the fourth group of instructions include instructions to count occurrences in which the input signal envelope is above the first reference threshold value and occurrences in which the input signal envelope is below the second reference threshold value.

20-21. (Cancelled).

22. (Currently Amended) The instructions of claim ~~20~~19, wherein the first group of instructions further comprises a fifth group of instructions, and wherein:

the fourth group of instructions to determine a percentage of time that the input signal envelope is either above or below the one or more reference threshold values within the given period, and generating an error signal;

the fifth group of instructions to select a step size factor based upon the error signal and to multiply the error signal with the selected step size factor to generate a variable error signal; and

the second group of instructions to adjust the gain in accordance with the variable error signal.

23. (Original) The instruction of claim 19, further comprising a third group of instructions to vary the speed by which the gain is adjusted by gear shifting based upon the distribution.

24. (Currently Amended) A communication system comprising:

a transmitter to transmit an analog signal;

a receiver to receive the analog signal, the receiver including an automatic gain control unit to maintain a constant level of the analog signal for processing in the receiver, the automatic gain control unit including:

an estimating unit to estimate a distribution of input signal envelope, the estimating unit comprises (i) a comparator to compare the input signal envelope against a first reference threshold value and a second reference threshold value, and (ii) a counter to estimate the distribution by counting occurrences in which the input signal envelope is either above or below the one or more reference threshold values within a given period, the counter counts occurrences

in which the input signal envelope is above the first reference threshold value and occurrences in which the input signal envelope is below the second reference threshold value; and

an integrator to adjust a gain based upon the distribution for the automatic gain control.

25-26. (Cancelled).

27. (Currently Amended) The communication system of claim ~~26~~24, wherein the first reference threshold value is higher than the second reference threshold value.

28. (Previously Presented) A communication system comprising:

a transmitter to transmit an analog signal;

a receiver to receive the analog signal, the receiver including an automatic gain control unit to maintain a constant level of the analog signal for processing in the receiver, the automatic gain control unit comprises:

an estimating unit to estimate a distribution of input signal level, the estimating unit comprises a comparator to compare the input signal level against one or more reference threshold values and a counter to estimate the distribution by counting occurrences in which the input signal level is either above or below the one or more reference threshold values within a given period

an integrator to adjust a gain based upon the distribution for the automatic gain control, and

a variable step size generator, and wherein:

the counter determines a percentage of time that the input signal level is either above or below the one or more reference threshold values within the given period, and generate an error signal;

the variable step size generator selects a step size factor based upon the error signal and multiplies the error signal with the selected step size factor to generate a variable error signal; and

the integrator adjusts the gain in accordance with the variable error signal.

29. (Currently Amended) An automatic gain control apparatus comprising:

a comparator to compare input signal level for an envelope of an input signal against one or more reference threshold values, the comparator to compare the input signal level against a first reference threshold value and a second reference threshold value;

a counter to count occurrences in which the input signal level is either above or below the one or more reference threshold values within a given period, the counter to count occurrences in which the input signal level is above the first reference threshold value and occurrences in which the input signal level is below the second reference threshold value; and

an integrator to adjust a gain for automatic gain control, the gain adjusted based upon the occurrences counted.

30. (Cancelled).

31. (Currently Amended) The apparatus of claim ~~30~~29, wherein the first reference threshold value is higher than the second reference threshold value.

32. (Original) The apparatus of claim 31, wherein the counter counts up when the input signal level is above the first reference threshold value and counts down when the input signal level is below the second reference threshold value.

33. (Currently Amended) An ~~The~~ apparatus comprising:

a comparator to compare input signal level against one or more reference threshold values;

a counter to count occurrences in which the input signal level is either above or below the one or more reference threshold values within a given period, to determine a percentage of time that the input signal level is either above or below the one or more reference threshold values within the given period, and to generate an error signal; and

a variable step size generator to select a step size factor based upon the error signal and multiplies the error signal with the selected step size factor to generate a variable error signal; and

an integrator to adjust a gain for automatic gain control in accordance with the variable error signal.

34. (Currently Amended) A method for automatic gain control comprising:

comparing input signal level associated with an envelope of an input signal against a first reference threshold value and a second reference threshold value~~one or more reference threshold values~~;

counting occurrences in which the input signal level is either above or below the one or more reference threshold values within a given period by counting occurrences in which the input signal level is above the first reference threshold value and occurrences in which the input signal level is below the second reference threshold value; and

adjusting a gain for automatic gain control based upon the occurrences counted.

35. (Cancelled).

36. (Original) The method of claim 34, wherein further comprising varying the speed by which the gain is adjusted by gear shifting based upon the distribution.